Bulletin 553

CANNING FRUITS & VEGETABLES

Cooperative Extension Service
The Ohio State University

CANNING FRUITS AND VEGETABLES

by

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with excerpts and photographs from USDA Bulletin 8, "Home Canning of Fruits and Vegetables"

5/73—10M

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U. S. Department of Agriculture. Roy M. Kottman, Director of Cooperative Extension Service, The Ohio State University.

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CANNING FRUITS & VEGETABLES

Home canning is still an important method of food preservation. Many advances in procedures and equipment have come to the front in recent years. However, we still find outbreaks of food poisoning each year; we hear reports of poor quality finished products, and we are asked many questions on how to can food properly in the home.

To start with, "Why can food in the home?"

1. A large quantity of food would go to waste each year if not home canned.
2. Canned food cupboards are important to keep food costs down, add variety to our diets, and provide nutrients on a year-round basis for better health.
3. There is a personal satisfaction in "doing your own thing" for those you love and cherish.

What are the principles or fundamentals of home canning? The basic reason for canning is to prevent spoilage. Spoilage is caused by microorganisms and or enzymes. All food products are contaminated with microorganisms, which are found in soil, water, and air. Microorganisms occur on the surface of the foods, baskets, utensils, and hands. Therefore, potential spoilage organisms are always present.

Enzymes are present in all living tissue. These enzymes are important to life and to the normal maturing or ripening of fruits and vegetables. If enzymes continue to act in fruits and vegetables after maturity, they bring about decay and/or other changes. To keep the desired color, flavor, and texture of the freshly harvested product, it should be preserved as soon as possible

In foods that have been properly sterilized by heat processing in canning, all organisms (yeasts, molds, bacteria) that would cause spoilage have been destroyed, and action of all enzymes that cause product quality losses is stopped. The time and temperature of the processing depends on the type and style of food being canned, the methods of preparation, the equipment used for processing, the size and kinds of containers, and the kinds of organisms potentially present.

TABLE I—Foods Can Be Grouped According to Acidity

Groups 1 and 2—Low-Acid (pH 4 6 and over)*
Asparagus, Beets, Carrots, Corn, Lima Beans, Mushrooms, Peas, Pumpkins, Snap Beans, Sweet Potatoes, White Potatoes, Spinach, and other greens Also meats, seafoods, milk, meat and vegetable mixtures and specialties, spaghetti, soups and sauces

Groups 3 and 4—Acid (pH 4 6 and under)
Apples, Apricots, Berries, Cherries, Grapes, Peaches, Pears, Pickles, Plums, Rhubarb, Sauerkraut, Tomatoes

* Foods in groups 1 and 2 are LOW in acid and provide natural conditions for growth of spore-forming bacteria as well as other organisms Spore-forming bacteria grow in the absence of oxygen (as in a sealed jar) If the time and temperature in the canning process are not sufficient, they will survive When these spore-forming bacteria survive and grow in low-acid canned foods an extremely poisonous toxin is produced If the toxin is consumed, death often is the result

Three types of *Clostridium Botulinum* (labeled A, B and E) have been shown to cause human botulism in the United States. Between 1899 and 1964, 651 botulism outbreaks were recorded in this country. Of the 1670 who became ill, 1008—60 percent—did not live.

Clostridium botulinum, which is found in most soils, is of great concern to the user of all canned foods. These bacteria do not cause illness, but the toxin is a poison. Low and medium acid foods MUST be processed at a time and temperature that will destroy these heat-resistant spores. This can only be done in the pressure canner.

The rate at which these bacterial spores are destroyed depends on temperature. The same amount of destruction takes place when foods are heated for one minute at 250°F, 10 minutes at 232°F, or 100 minutes at 214°F. If the long time, low temperature process is used, there is a great loss of color, flavor, and texture in some foods. Times and temperatures for adequately processing fruits and vegetables are given on Tables II and III.

Adequate heat processing (sterilization) is only one-half of successful canning of foods. Food must be sterilized in a container that will prevent contact with microorganisms. Air coming in contact with food after it is sterilized will contaminate it with new yeasts, molds, and/or bacteria, and the effect of processing would be lost. It is just as important to seal the food in an airtight container to protect the food from more contamination as it is to sterilize the food after it has been put in the container and sealed. Canning is based on two factors: *sterilization* and *protection.*

THE RIGHT CANNER FOR EACH FOOD

For all common vegetables in groups 1 and 2, use a steam-pressure canner. To process these low-acid foods safely in a reasonable length of time takes a temperature higher than that of boiling water.

A pressure saucepan equipped with an accurate indicator or gage for controlling pressure at 10 pounds (240°F.) may be used

as a steam-pressure canner for vegetables in pint jars or No. 2 tin cans. If you use a pressure saucepan, add 20 minutes to the processing times given in this publication for each vegetable.

For groups 3 and 4 (fruits, tomatoes, and pickled vegetables), use a boiling-water--bath canner You can process these acid foods safely in boiling water.

GETTING YOUR EQUIPMENT READY

Steam-Pressure Canner

For safe operation of your canner, clean petcock and safety-valve openings by drawing a string or narrow strip of cloth through them. Do this at the beginning of the canning season and often during the season.

Check pressure gauge. An accurate pressure gauge is necessary to get the processing temperatures needed to make food keep.

A weighted gauge needs to be thoroughly clean.

A dial gauge, old or new, should be checked before the canning season, and also during the season if you use the canner often. Ask your county home economics agent, equipment dealer, or manufacturer about checking it.

If your gauge is off 5 pounds or more, you'd better get a new one. But if the gauge is not more than 4 pounds off, you can correct for it as shown below. As a reminder, tie on the canner a tag stating the reading to use to get the correct pressure.

The food is to be processed at 10 pounds steam pressure, so;

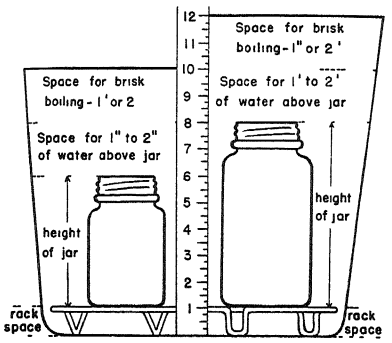
If the gauge reads high—	*If the gauge reads low—*
1 pound high— process at 11 pounds	1 pound low— process at 9 pounds
2 pounds high— process at 12 pounds	2 pounds low— process at 8 pounds
3 pounds high— process at 13 pounds	3 pounds low— process at 7 pounds
4 pounds high— process at 14 pounds	4 pounds low— process at 6 pounds

Have canner thoroughly clean. Wash canner kettle well if you have not used it for some time. Don't put cover in water—wipe it with a soapy cloth, then with a damp, clean cloth. Dry well.

Water-Bath Canner

Water-bath canners are available on the market. Any big metal container may be used as a boiling-water-bath canner if it is deep enough so that the water is well over the tops of jars and has space to boil freely. Allow 2 to 4 inches above jar tops for brisk boiling (see sketch). The canner must have a tight-fitting cover and a wire or wooden rack. If the rack has dividers, jars will not touch each other or fall against the sides of the canner during processing.

If the steam-pressure canner is deep enough, you can use it for a water bath. Cover, but do not fasten cover. Leave petcock wide open, so that steam escapes and pressure does not build up inside the canner.



Glass Jars

Be sure all jars and closures are perfect. Discard any with cracks, chips, dents, or rust; defects prevent airtight seals.

Select the size of closure—widemouth or regular—that fits your jars.

Wash glass jars in hot, soapy water, and **rinse well.** Wash and rinse all lids and bands. Metal lids with sealing compound may need boiling or holding in boiling water for a few minutes—follow the manufacturer's directions.

If you use rubber rings, have clean, new rings of the right size for the jars. Don't test by stretching. Wash rings in hot, soapy water. Rinse well.

Tin Cans

Select desired type and size. Three types of tin cans are used in home canning: plain tin, C-enamel (corn enamel), and R-enamel (sanitary or standard enamel). For most products, plain tin cans are satisfactory. Enamel cans are recommended for certain fruits and vegetables to prevent discoloration of food, but they are not necessary for a wholesome product.

The types of can and the foods for which they are recommended are:

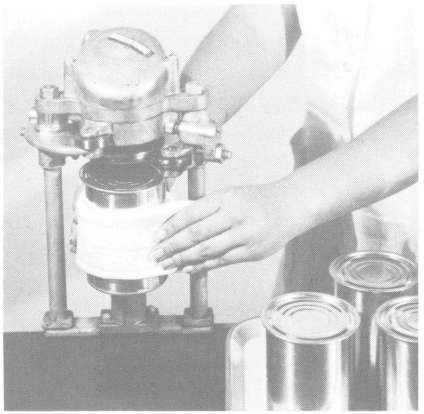
Type of can	Recommended for
C-enamel	Corn, hominy.
R-enamel	Beets, red berries, red or black cherries, plums, pumpkin, rhubarb, winter squash.
Plain	All other fruits and vegetables for which canning directions are given in this bulletin.

In this bulletin, directions are given for canning most fruits and vegetables in No. 2 and No. 2½ tin cans. A No. 2 can holds about 2½ cups, and a No. 2½ can about 3½ cups.

Use only cans in good condition. See that cans, lids, and gaskets are perfect. Discard badly bent, dented, or rusted cans, and lids

with damaged gaskets. Keep lids in paper packing until ready to use. The paper protects the lids from dirt and moisture.

Wash cans. Just before use, wash cans in clean water; drain upside down. Do not wash lids; washing may damage gaskets. If lids are dusty or dirty, rinse with clean water or wipe with a damp cloth just before you put them on the cans.



A can sealer is needed if tin cans are used.

Check the sealer. Make sure the sealer you use is properly adjusted. To test, put a little water into a can, seal it, then submerge can in boiling water for a few seconds. If air bubbles rise from around the can, the seam is not tight. Adjust sealer, following manufacturer's directions.

STEPS TO CANNING SUCCESS

Select only high quality foods. All vegetables should be fresh, bright colored, young and tender, and free from disease or insect injury. All fruits should be mature or ripe, fresh, and sound. Keep varieties separate to give uniform quality to the canned product. Can them before they lose their freshness. If you buy vegetables or fruits for canning, try to get them from a nearby garden or orchard.

Sort fruits for ripeness and use only ripe fruits for canning. Discard all overripe products. Immature fruits should be allowed to ripen before canning.

Washing. Wash all fruits and vegetables thoroughly, whether or not they are to be pared. Dirt contains some of the bacteria hardest to kill. Wash in small lots under running water or through several changes of water. Lift the food out of the water each time so dirt that has been washed off won't go back on the food. Rinse pan thoroughly between washings. Don't let fruits or vegetables soak; they may lose flavor and food value. Handle them gently to avoid bruising.

If there is any sign of pests or pesticides, or if produce is heavily soiled or has an evidence of decay, soak produce for 2-5 minutes in a lukewarm (not over 100°F) detergent solution. Use 2 teaspoons of regular dish detergent per gallon of water. Shake or mix gently while soaking. Drain and rinse several times with cold water. Prepare as for table use.

Blanch before canning. To pack hot, put produce in either live steam or hot water for a short time. Length of heating in steam or hot water (blanching) will vary with the product from one minute up to several minutes for large pieces. The purpose of the blanch is 1) to inactivate the enzymes, 2) to soften the product for easier filling of containers, 3) to remove gases normally held in the fresh living tissues, 4) to remove some of the organisms normally present on the product, and 5) to improve the flavor by removing some of the "earthy" or "viny" flavors. *Do not cool the product when canning.*

Sirups and brines should be made up fresh as needed, brought to a boil, and added to the product at a temperature as near boiling as possible. The strength of sirup may vary with the family's taste and/or the type of product. A medium sirup is usually adequate. This is made by adding 3 cups of sugar to 4 cups of water. Less sugar will make a less sweet product, while more sugar will make a sweeter pack. For a brine pack, cover the packed product with boiling water and add salt, ½ teaspoon for pints or No. 303 cans (1-pound container) and 1 teaspoon for quarts or No. 2½ cans (28 ounces). The amount of salt may be varied to taste. If desired, both sugar and salt may be left out, but the canned products will be very bland in taste.

Filling Containers

Most raw fruits and vegetables should be packed tightly into the container because they shrink during processing; a few—like peas—should be packed loosely because they expand.

Hot food should be packed fairly loosely. It should be at or near boiling temperature when it is packed.

There should be enough sirup, water, or juice to fill in around the solid food in the container and to cover the food. Food at the top of the container tends to darken if not covered with liquid. It takes from ½ to 1½ cup of liquid for a quart glass jar or a No. 2½ tin can.

Head space. With only a few exceptions, some space should be left between the packed food and the closure. The amount of space to allow at the top of the jar or can is given in Tables II and III.

Exhaust all products following filling with the product and sirup or brine, for success in canning. The purposes of the exhaust is to remove any air in the container before sealing. Exhausting 1) insures a good vacuum, 2) prevents undue strain on the container during process, 3) prevents discoloration or color changes of the product, 4) extends the shelf life or the product, 5) reduces chemical changes and loss of vitamin C, and 6) prevents overfilling of containers.

After the jar or can has been filled with product and liquid, exhaust container by placing in a hot water bath. The water should be deep enough to come within 1½ inches of the top of the container. The water should be near boiling when jars or cans are put in it.

The center temperature of the product in the cans or jars should be at least 180°F before closing. This will take a minimum of 7 minutes in boiling water for pints and 10 minutes for quarts. Some products will take much longer. As soon as the center temperature is 180°F, remove the container from the water bath and seal at once. Handle with care and use special jar lifters to prevent burning. Immediately process all containers.

Exhausting may be eliminated if the food is thoroughly heated and kept hot during the filling. This may be done by pre-heating the product in water or steam. Sirup or juice may be used to heat fruits. When at or near boiling, fill clean, warm containers. Keep product near boiling while filling containers. Pack product loosely into containers. There should be enough of sirup, water, or juice to fill in around pieces and cover the product. If cooking liquid from vegetables is acceptable (not dark, gritty, or strong-flavored), it should be used to cover the product because it may contain dissolved vitamins or minerals. As soon as containers are filled, seal and process at once.

Closing Glass Jars

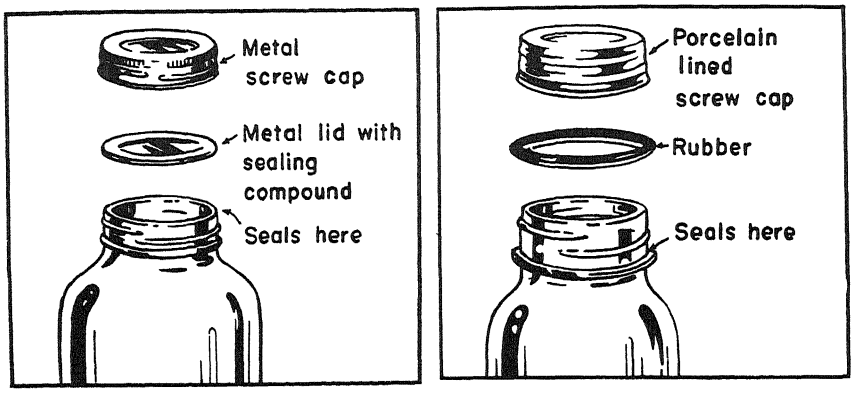
Closures for glass jars are of two main types:

Metal screwband and **flat metal lid with sealing compound.** To use this type, wipe jar rim clean after produce is packed or exhausted. Put lid on, with sealing compound next to glass. Screw metal band tight by hand. When band is tight, this lid has enough give to let air escape during processing. Do not tighten screw band further after taking jar from canner.

Screw bands that are in good condition may be reused. You may remove bands as soon as jars are cool. Metal lids with sealing compound may be used only once.

Porcelain-lined zinc cap with shoulder rubber ring. Fit wet rubber ring down on jar shoulder, but don't stretch unnecessarily. Fill jar. Wipe rubber ring and jar rim clean. Then screw cap down firmly and turn it back ¼ inch. As soon as you take jar from canner, screw cap down tight, to complete seal.

Porcelain-lined zinc caps may be reused as long as they are in good condition. Do not reuse rubber rings.



Exhausting and Sealing Tin Cans

Tin cans are sealed before processing. The temperature of the food in the cans must be 180°F or higher when the cans are sealed. Food is heated to this temperature to drive out air so that there will be a good vacuum in the can after processing and cooling. Removal of air helps prevent discoloring of canned food and change in flavor.

Food packed raw must be heated in the cans (exhausted) before the cans are sealed. Food packed hot may be sealed without further heating, if you are sure the temperature of the food has not dropped below 180°F. To make sure, test with a thermometer, placing the bulb at the center of the can. If the thermometer registers lower than 180, or if you do not make this test, exhaust the cans.

Remove cans from the water one at a time, and add boiling packing liquid or water, if necessary, to bring head space back to the level specified for each product. Place clean lid on filled can. Seal at once.

Follow directions in processing. Each manufacturer provides detailed directions for the use of his pressure canner. These directions should be followed carefully. Check with the dealer or manufacturer if you have questions on use of the pressure canner.

Tables II and III give minimum safe processing times and temperatures by container size for each of the products most often canned in Ohio. *No reductions in these process times and temperatures should be made to produce safe and wholesome canned foods.* Regardless of how well selection, preparation, blanching, filling, exhausting, and closing are done, if the product is not adequately processed, it may spoil and possibly be unsafe.

Immediately following the recommended time and temperature processing, the product should be adequately cooled to prevent: 1) loss of nutrients and/or quality (texture, color, flavor) and

2) the growth of heat-loving bacteria. Nutrient loss, quality changes and bacterial growth occur in the container if the internal temperature of the product after processing is in the range of 115° to 150°F for any period of time. The product should be cooled to storage temperature (room temperature or lower) as rapidly as possible.

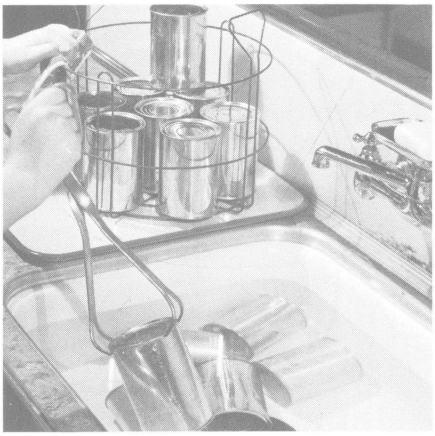
As soon as processing is completed, metal containers can be removed and immediately immersed in cold water. When cans are brought to the temperature of cold water, wipe dry and store.

The glass container should be removed from the pressure cooker as soon as pressure is completely down to zero°F, and from water bath as soon as time is complete. For faster cooling, space the jars well apart at room temperature and out of drafts.

As you take the jars from the canner, complete seals at once, if necessary. If liquid boiled out in processing, do not open jar to add more. Seal the jar just as it is.

Cool jars top side up. Give each jar enough room to let air get at all sides. Never set a hot jar on a cold surface; instead set the jars on a rack or on a folded cloth. Keep hot jars away from drafts, but don't slow cooling by covering them. Allow to cool thoroughly before storing.

Cool jars top side up on a rack, leaving space between jars so air can circulate.



Cool tin cans in cold water; change water frequently to cool cans quickly.

Day-After-Canning Jobs

Test the seal on glass jars with porcelain-lined caps by turning each jar partly over in your hands. To test a jar that has a flat metal lid, press center of lid; if lid is down and will not move, jar is sealed. Or tap the center of the lid with a spoon. A clear, ringing sound means a good seal. A dull note does not always mean a poor seal; store jars without leaks and check for spoilage before use.

If you find a leaky jar, use unspoiled food right away. Or can it again; empty the jar, and pack and process food as if it were fresh. Before using jar or lid again, check for defects.

When jars are thoroughly cool, take off the screw bands carefully. If a band sticks, covering for a moment with a hot, damp cloth may help to loosen it.

Before storing canned food, wipe containers clean, Label to show contents, date, and lot number — if you canned more than one lot in a day. Wash bands and store them in a dry place.

Label jars after they have been cooled.

Storing Canned Food

Properly canned food stored in a cool, dry place will retain good eating quality for a year. Canned food stored in a warm place near hot pipes, a range, or a furnace, or in direct sunlight may lose some of its eating quality in a few weeks or months, depending on the temperature.

Dampness may corrode cans or metal lids and cause leakage so the food will spoil.

Freezing does not cause food spoilage unless the seal is damaged or the jar is broken. However, frozen canned food may be less palatable than properly stored canned food. In an unheated storage place, it is well to protect canned food by wrapping the jars in paper or covering them with a blanket.

Using Home Canned Foods

NEVER eat foods from Groups 1 and 2, (low-acid), directly from the can or jar. If a container of any food shows any signs of leakage, fermentation or spoilage, has an abnormal color or odor, or is moldy, or if the brine or sirup is cloudy when opened, the food should be destroyed by burying or packing in heavy plastic trash containers for collection. Spoiled food should never be fed to pets or other animals.

After opening the cans or jars, bring all foods in Groups 1 and 2 to a rolling boil, then cover and boil for at least 10 minutes before using; except for canned corn and greens, which should be boiled for 20 minutes. These foods in Groups 1 and 2 may not show visible signs of microorganism growth after processing or during

storage, even when opened for use. If the microorganisms had grown and produced a toxin, the boiling would destroy the toxin, and the food would be acceptable to eat. However, if there is any abnormal odor after boiling or any question about the safety of the food, the product should be discarded as indicated above.

There is little danger of poisoning from home canned food, if the instructions for canning are followed carefully and if the food is heated as indicated above. Home canning is highly recommended and provides many satisfactions to the one who cans the food. Home canned foods are good products, and they provide good nutritious food for the family.

HOW TO CAN FRUITS

Fruits are canned according the general directions. Special directions given below apply only to acid foods (Groups 1 and 2).

Points on Packing

Raw pack. Put cold, raw fruits into container and cover with boiling-hot sirup, juice, or water.

Hot pack. Heat fruits in sirup, in water or steam, or in extracted juice before packing.

Light-colored fruit (peaches, pears, apples) may turn dark after peeling. This can be prevented by dropping into water containing two tablespoons each of salt and vinegar per gallon. Drain and prepare according to Table II.

To hot pack fruit, pack heated fruit loosely into jars.

Cover fruit with boiling liquid before closing jar and processing in boiling-water bath.

Sweetening Fruit

Sugar helps canned fruit hold its shape, color, and flavor. Directions for canning most fruits call for sweetening to be added in the form of sugar sirup. For very juicy fruit packed hot, use sugar without added liquid.

To make sugar sirup. Mix sugar with water or with juice from some of the fruit. Use a thin, medium, or heavy sirup to suit the sweetness of the fruit and your taste. To make sirup, combine—

4 cups of water or juice...2 cups sugar...For 5 cups LIGHT sirup.
3 cups sugar...For 5½ cups MEDIUM sirup.
4¾ cups sugar...For 6½ cups HEAVY sirup.

Heat sugar and water or juice together until juice is dissolved. Skim if necessary.

To extract juice. Thoroughly crush ripe, sound juicy fruit. Heat to simmering (185° to 210°F.) over low heat. Strain through jelly bag or other cloth.

To add sugar direct to fruit. For juicy fruit to be packed hot, add about ½ cup sugar to each quart of raw, prepared fruit. Heat to simmering (185° to 210°F.) over low heat. Pack fruit in the juice that cooks out.

To add sweetening other than sugar. You can use light corn sirup or mild-flavored honey to replace as much as half the sugar called for in canning fruit. Do not use brown sugar, or molasses, sorghum, or other strong-flavored sirups; their flavor overpowers the fruit flavor, and they may darken the fruit.

Canning Unsweetened Fruit

You may use fruit without sweetening—in its own juice, in extracted juice, or in water. Sugar is not needed to prevent spoilage; processing is the same for unsweetened fruit as for sweetened.

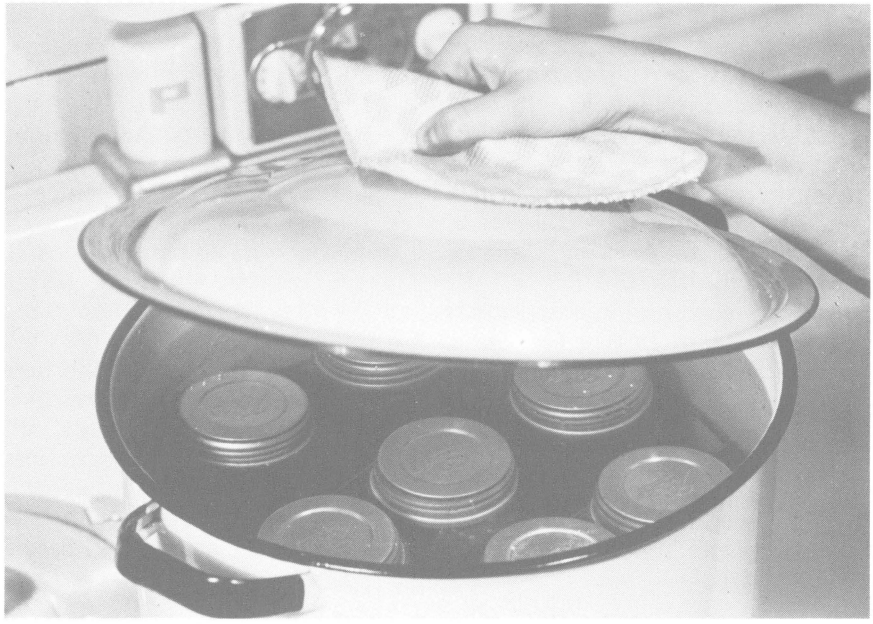
Processing in Boiling-Water Bath

Directions. Put filled glass jars or tin cans into canner containing hot or boiling water. For raw pack in glass jars have water in canner hot but not boiling; for all other packs have water boiling. Exhaust and seal.

Add boiling water if needed to bring water an inch or two over tops of containers; don't pour boiling water directly on glass jars. Put cover on canner.

When water in canner comes to a rolling boil, start to count processing time. Boil gently and steadily for time recommended for the food you are canning. Add boiling water during processing, if needed to keep containers covered.

Remove containers from the canner immediately when processing time is up.



After jars are covered with boiling water, place lid on water-bath canner and bring water quickly back to boiling.

HOW TO CAN TOMATOES

1. Remove the peel by dipping in boiling water for 20 to 40 seconds, and immediately immerse in cold water.
2. Remove stem scar and core. Cut carefully so as not to open the seed cavity.
3. (a) For whole-pack tomatoes, use the smaller fruits and fill the container, leaving headspace. Do not crush the fruits.
   (b) For diced, quarter, or chunk pack, use large firm fruits and cut the fruit accordingly. Fill the container, leaving headspace.
4. For each **pint** container or #303 can, add the following:
   (a) ½ teaspoon salt.
   (b) ½ teaspoon lemon juice or ¼ teaspoon of citric acid (available at a drug store as crystalline citric acid monohydrate.)

Newer tomato varieties do not have as much natural acid content as older varieties. It is more difficult to sterilize low-acid tomatoes than those of higher acid content by generally accepted home canning methods. Addition of lemon juice or citric acid as described above assures a safe acid level in all tomatoes that might be canned at home.

(c) If a sweeter product is desired, add ¼ to ½ teaspoon of granulated sugar.

Use twice the above amounts for quart containers or #2½ cans.

5. Remove all air from packed tomatoes to insure a good vacuum for safety and quality retention.
   (a) The recommended method is to add hot tomato juice—made by heating the large fruits and pressing through a colander or sieve. (Do not use hot water because it dilutes the flavor.) Place can or jar in a boiling water bath and exhaust air by heating in water bath to a center temperature (center of the fruits) of 180°F.
   (b) An alternate method of removing the air is to fill the jars with boiling (210° to 212°F.) tomato juice. If tomatoes are not tightly packed, addition of the boiling juice will produce a satisfactory product. However, this is not as effective as exhausting.
6. Place lids on the containers.
7. Process in boiling water in hot water bath, as for fruits, see above.

HOW TO CAN VEGETABLES

Can vegetables according to general directions. Special directions below apply only to vegetables.

Points on Packing

Preheat (blanch) vegetables in water or steam. Cover with cooking liquid or boiling water. Cooking liquid is recommended for packing most vegetables because it may contain minerals and vitamins dissolved out of the food. Boiling water is recommended when cooking liquid is dark, or strong-flavored, and when there isn't enough cooking liquid.

Processing in a Pressure Canner

Use a steam-pressure canner for processing all vegetables except tomatoes and pickled vegetables.

Directions. Follow the manufacturer's directions for the canner you are using. Here are a few pointers on the use of any steam-pressure canner:

- Put 2 or 3 inches of boiling water in the bottom of the canner; the amount of water to use depends on the size and shape of the canner.
- Set filled glass jars or tin cans on rack in canner so that steam can flow around each container. If two layers of cans or jars are put in, stagger the second layer. Use a rack between layers of glass jars.
- Fasten canner cover securely so that no steam can escape except through vent (petcock or weighted-gauge opening).

- Watch until steam pours steadily from vent. Let it escape for 10 minutes or more to drive all air from the canner. Then close petcock or put on weighted gauge.
- Let pressure rise to 10 pounds (240°F.) The moment this pressure is reached start counting processing time. Keep pressure constant by regulating heat under the canner. Do not lower pressure by opening petcock. Keep drafts from blowing on canner. Follow processing times carefully. The times given apply only when a specific food is prepared according to detailed directions.
- When processing time is up, remove canner from heat immediately.

With glass jars, let canner stand until pressure is zero. Never try to rush the cooling by pouring cold water over the canner. When pressure registers zero, wait a minute or two, then slowly open petcock or take off weighted gauge. Unfasten cover and tilt the far side up so steam escapes away from you. Take jars from canner.

With tin cans, release steam in canner as soon as canner is removed from heat by opening petcock or taking off weighted gauge. Then take off canner cover and remove cans.

To process vegetables, bring pressure in canner up to 10 pounds, then start to count processing time.

TABLE II—Canning Fruits and Fruit Juices

PRODUCTS	PREPARATION*	SIRUP	STERILIZATION TIME IN MINUTES IN BOILING WATER (212 F.)			
			CANS		JARS	
			303	2½	PINTS	QUARTS
Apples	Peel, core, quarter, blanch 5 minutes, fill hot, cover with sirup and close	water or light	10	10	15	20
Apple Juice	Crush fruit, heat slowly to 180 F, strain, heat to 200 F, skim fill, close	—	10	10	10	10
Apricots	Wash peel, cut in halves, remove pits fill, cover with sirup, exhaust and seal	up to medium	20	25	25	30
Berries	Wash, drain fill, cover with sirup, exhaust, close	light to medium	10	10	10	15
Cherries—sour	Wash, stem pit, fill, cover with water exhaust, close	water	10	15	20	30
Cherries—sweet	Wash, stem fill, cover with sirup, exhaust close	up to medium	10	15	20	30
Grape Juice	Cook washed fruit, strain, reheat, fill, close	—	10	10	10	10
Peaches	Wash, peel, cut in halves, remove pits, slice if desired, fill cover with sirup, exhaust, seal	up to medium	20	25	25	30
Pears	Wash, peel, cut in halves core, fill, cover with sirup, exhaust, seal	up to medium	20	25	25	30
Plums	Wash, fill, cover with sirup, exhaust, seal	up to medium	15	20	20	25
Rhubarb	Wash, cut in 1½" pieces, add dry sugar—3 or 4+1, Mix, let stand 3 4 hrs Heat to boiling and boil ½ min, fill exhaust, seal	—	10	15	10	25
Tomatoes*	Wash, peel, core if necessary, fill, cover with hot juice, add salt, citric acid, exhaust, seal	—	20	30	20	30

* Fill all tin cans to ⅜ to ½ inch of top, glass jars to ½ inch for wide mouth, ¾ inch for mason jars

TABLE III—Canning Vegetables

COMMODITY	PREPARATION	Sterilization Time In Minutes at 240 F. — 10 Lbs. Pressure		
		2½ CANS	JARS	
		OR SMALLER	PINTS	QUARTS
*Asparagus	Wash, trim, cut 1" pieces, blanch, fill hot, cover with brine, exhaust, seal and process.	20	25	30
*Beets	Wash, trim, precook and peel, cut into ½" pieces or slice ¼", fill, cover with brine, exhaust, seal and process.	30	30	35
†Carrots	Wash, peel and trim, slice, fill, cover with brine, exhaust, seal and process.	20	25	30
†Corn—whole kernel	Husk, silk, cut kernels from cob, blanch, fill hot, cover with brine, exhaust, seal and process.	60	60	85
†Corn—cream style	Husk, silk, cut kernels in half and scrape cobs, mix corn with sugar and salt, 1% corn starch and water to desired consistency. Bring to boil, fill hot, seal and process.	105	105	—
*Greens	Wash, remove tough stems, blanch in water at 180° F., fill hot, cover with brine, seal and process.	75-#303 95-#2-½	80	105
†Lima Beans	Shell, wash, blanch, fill hot, cover with brine, exhaust, seal and process.	40	40	50
†Peas	Shell, wash, fill, cover with brine, exhaust, seal and process.	35	40	45
*Pumpkin or Squash	Wash, cut in quarters, remove seeds, peel, cut into 1" pieces, steam until soft, strain or mill, reheat, fill hot, seal and process.	75-#303 115-#2-½	90	125
*Snap Beans	Trim, cut 1" pieces, wash, blanch, fill hot, cover with brine, exhaust, seal and process.	26-#303 30-#2-½	25	30
†Sweet Potatoes	Wash, cook, slip skins, fill, exhaust, seal.	90-#303 120-#2-½	95	115
*White Potatoes	Wash, peel, blanch, fill, cover with boiling water, exhaust, seal.	35-#303 40-#2-½	35	40

* Fill tin cans to ⅜ to ½ inch of top, glass jars to ½ inch for wide mouth, ¾ inch for mason jars.

† Fill glass jars to 1 inch of top, tin cane to ⅜ to ½ inch of top.

TABLE IV—Approximate Canned Product Yield from Given Fresh Weight of Specific Fruits and Vegetables

PRODUCT	FRESH WEIGHT	2½ CANS OR QUART JARS	303 CANS OR PINT JARS
Apples	1 bu. (48 lbs.)	18	34-36
Apple Juice	1 bu. (48 lbs.)	10	20
Apricots	1 crate (22 lbs.)	7-11	14-22
Grape Juice	30 lbs.	10	20
Rhubarg	1 bu. (25 lbs.)	12	20
Berries other than Strawberries	1 crate (24 qts.)	16	30-32
Cherries (sour)	1 crate (24 qts.)	20	36-40
Cherries (sweet)	1 crate (24 qts.)	22	38-42
Peaches	1 bu. (48 lbs.)	21	34-38
Pears	1 bu. (56 lbs.)	23	42-46
Plums	1 bu. (54 lbs.)	26	40-46
Asparagus	1 bu. (45 lbs.)	11	20
Lima Beans	1 bu. (32 lbs.)	7	12-14
Snap Beans	1 bu. (28 lbs.)	15	26-30
Beets	1 bu. (55 lbs.)	18	30-36
Carrots	1 bu. (50 lbs.)	18	30-36
Corn—unhusked	1 bu. (35 lbs.)	8	14-16
Greens	1 bu. (15 lbs.)	—	12-14
Peas	1 bu. (28 lbs.)	8	12-16
Pumpkin	50 lbs.	15	30
Squash	1 bu. (40 lbs.)	18	34-38
Tomatoes	1 bu. (55 lbs.)	20	40
White Potatoes	1 bu. (50 lbs.)	20	40
Sweet Potatoes	1 bu. (50 lbs.)	20	40